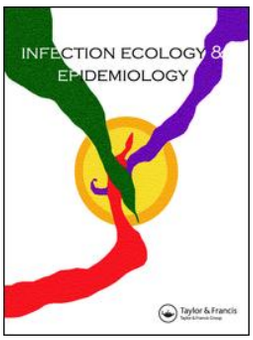

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Ashish Chandra Shrestha, Prakash Ghimire, Bishnu Raj Tiwari & Manita Rajkarnikar

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ORIGINAL ARTICLE

COACTION PUBLISHING

Co-infection rate of HIV, HBV and Syphilis among HCV seropositive identified blood donors in Kathmandu, Nepal

Ashish Chandra Shrestha*[,1], Prakash Ghimire[2] Bishnu Raj Tiwari[3] and Manita Rajkarnikar[4]

[1]Lecturer, Department of Microbiology, Gandaki Medical College Teaching Hospital and Research Centre, Kaski, Nepal; [2]Associate Professor, Central Department of Microbiology, Tribhuvan University, Kirtipur, Nepal; [3]Professor, Faculty of Science and Technology, Pokhara University, Lekhnath, Kaski, Nepal; [4]Director, Central Blood Transfusion Service, Nepal Red Cross Society, Kathmandu, Nepal

Background: HIV, HBV, Syphilis and HCV share common modes of transmission.
Objective: The study was aimed to determine the co-infection rate of HIV, HBV and Syphilis among HCV seropositive identified blood donors.
Methods: The study was conducted on blood samples screened as HCV seropositive at Nepal Red Cross Society, Central Blood Transfusion Service, Kathmandu, Nepal. HCV seropositive samples were further tested for HIV, HBV and Syphilis.
Results: Eight co-infections were observed in 139 HCV seropositives with total co-infection rate of 5.75% (95% CI = 2.52–11.03).
Conclusion: Co-infection of HIV, HBV and Syphilis with HCV is prevalent in the healthy looking blood donors of Kathmandu, Nepal.

Keywords: *co-infection*; *HCV*; *HIV*; *HBV*; *syphilis, seropositive blood donors*

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Common mode of transmission of various infections can result in the simultaneous prevalence of these infections in the same human population. Worldwide, hepatitis B virus (HBV) accounts for an estimated 370 million chronic infections, hepatitis C virus (HCV) for an estimated 130 million, and HIV for an estimated 40 million. In HIV-infected persons, an estimated 2–4 million have chronic HBV co-infection and 4–5 million have HCV co-infection. HBV, HCV and HIV share common routes of transmission, but they differ in their prevalence by geographic region and the efficiency by which certain types of exposures transmit them (1). Syphilis being a sexually transmitted disease, its presence points towards indulgence in "high risk" behaviour and consequently higher risk of exposure to infections like HIV and hepatitis (2).

In the year 2008, seroprevalence of HIV, HBV, HCV and syphilis has been determined to be 0.12, 0.46, 0.64 and 0.48% respectively in the study conducted in Kathmandu, Nepal (3). The study indicates prevalence of these infections which has common mode of transmission. However, co-infection rate is yet to be estimated in the population with such infection. Co-infection of HCV in HIV, HCV in HBsAg, HBV in HIV has been estimated to be 10.8, 1.67 and 2.6% respectively in the Nepalese blood donors (4–6). Co-incidence of HBV markers have been reported with syphilis in Austria (7). The current investigation in contrary gives the co-infection rate of HIV, HBV and Syphilis in HCV seropositive blood donors.

The study was conducted to study the co-infection rate of HIV, Hepatitis B and Syphilis among the Hepatitis C seropositive cases (blood donors) visiting the Central Blood Transfusion Service in Kathmandu where a mixed population from all over the country resides. Determination of co-infection of these infections among healthy looking blood donors yet seropositive to HCV, can provide useful information on the behaviour pattern of the general population such as HIV/HCV co-infection

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Table 1. Co-infections in HCV seropositive blood donors

HCV seropositive	Co-infection	Number of co-infections	Co-infection rate
139	HIV/HCV	5	3.59% (5/139) 95% CI = 1.18–8.19
	HBV/HCV	1	0.71% (1/139) 95% CI = 0.02–3.94
	Syphilis/HCV	2	1.43% (2/139) 95% CI = 0.01–5.1

prevalence indicate HIV transmission among injecting drug users who are usually infected with HCV. It is estimated that 50–90% of IDUs with HIV also have HCV infection (8).

Materials and methods

The study was conducted from March 2008 till September 2008 among 139 HCV seropositive cases (identified during the period) of 18–60 years of age with both sexes included. The cases were identified at Nepal Red Cross Society (NRCS), Central Blood Transfusion Service (CBTS), Kathmandu, Nepal. Information of the subjects such as age and gender was accessed from the standard blood donor questionnaire form of CBTS recorded by health professionals from the blood donors. Samples were tested with confidentiality and identified by the sample code number given during the sample collection. Ethical approval to conduct the study was taken from CBTS. WHO strategy 2 for surveillance diagnosis of HIV was used for the test of the samples (9). Samples were tested with the kits recommended in use by CBTS. Blood samples were tested for HCV using ELISA test kits EIAgen HCV Ab kit (Adaltis, Italy) confirmed with SD Bioline HCV (Standard Diagnostics, Inc., Korea).

HCV seropositive cases were tested for HIV, HBV and Syphilis with ELISA test kits Enzygnost® Anti-HIV ½ Plus (Dade Behring, Germany), Enzygnost® HBsAg 5.0 (Dade Behring, Germany), SD Syphilis ELISA 3.0 (Standard Diagnostics, Inc., Korea) respectively. The positive test results for HIV, HBV and Syphilis were confirmed with rapid immunochromatographic test kits SD Bioline HIV-½ 3.0 (Standard Diagnostics, Inc., Korea) and ViruchekHBsAg (Orchid Biomedical Systems, India) respectively while Syphilis was confirmed with the same ELISA test kit. Test results with seropositivity for HIV, HBV and Syphilis among HCV positive samples were considered to determine the co-infection rate. Co-infection rate was determined in percentage and 95% confidence interval calculated.

Results

Among the 139 HCV seropositive cases, eight of them were determined to have co-infections with total co-infection rate of 5.75% (95% CI = 2.52 − 11.03). Co-infection rate of HIV among HCV was 3.59%, HBV among HCV was 0.71% and Syphilis among HCV was 1.43% (Table 1). None of the HCV seropositive samples were positive to more than one infection. All the co-infection cases were male though 11 HCV seropositive females were included in the study. HIV/HCV co-infection was seen in the age group between 21–50 years. HBV/HCV co-infection in the age group 31–40 years and Syphilis/HCV in the age group 21–30 years.

Discussion

Prevalence of HIV, HBV and Syphilis co-infection among HCV cases indicates that the infections could be transmitted simultaneously due to their common modes of transmission. HCV is more commonly transmitted among IDUs and the co-infection of HIV, HBV and Syphilis with HCV can be due to transmission modes such as sharing of needles or unsafe sexual transmission among such risk groups. HIV/HCV was the most common co-infection followed by Syphilis/HCV and HBV/HCV. Prevalence of higher HIV/HCV co-infection in this study can be due to the practice of injecting drug use as many IDUs who become infected with HIV are already infected with HCV. HIV/HCV co-infection determined is lower than the reported co-infection rate of 10.8% with HCV and HIV (4). Co-infection rate of HIV in HCV estimated is similar to the reported rate of HCV co-infection in HIV patients in North India (2.43%) and 2.2% reported in South India (10, 11). HBV/HCV co-infection is lower than the HCV/HBV co-infection rate of 1.67% reported in Nepalese blood donors (5). Lower co-infections rate in this study is due to the low-risk group of population (healthy looking blood donors) considered; decreasing prevalence of transfusion transmissible infections (3). Higher HIV/HCV co-infection indicates HIV risks associated with the injecting drugs users who are usually infected with HCV. Prevalence of co-infections observed in the study in only males indicates indulgence of such gender groups in unsafe practices that could have transmitted the multiple infections. Monitoring of co-infections is necessary to commence immediate treatment of the cases besides prevention of transfusion associated risks with such blood donors.

Co-infection of HIV, HBV and Syphilis with HCV is prevalent in the blood donors of Kathmandu, Nepal. Further investigations can be carried out with larger sample size and in high risk groups with other infections sharing common modes of transmission to estimate the co-infections in the general population of the country.

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Conflict of interest and funding

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***Ashish Chandra Shrestha**
Lecturer, Department of Microbiology,
Gandaki Medical College Teaching Hospital and
Research Centre, Kaski, Nepal
PO Box-20306, Kathmandu, Nepal
Tel: +977 9841692901
Email: ashishcshrestha@yahoo.com